# Health Consultation

Outdoor Air Quality Evaluation Philip Services - Georgetown Facility Seattle, King County, Washington

June 19, 2001

Prepared by

Washington State Department of Health Under Cooperative Agreement with Agency for Toxic Substances and Disease Registry



#### Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The health consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

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# Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short-term (acute) or long-term (chronic).
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Indeterminate public health hazard	Sites for which no conclusions about public health hazard can be made because data are lacking.
Inorganic	Compounds composed of mineral materials, including elemental salts and metals such as iron, aluminum, mercury, and zinc.
Oral Reference Dose (RfD)	An amount of chemical ingested into the body (i.e., dose) below which health effects are not expected. RfDs are published by EPA.
Organic	Compounds composed of carbon, including materials such as solvents, oils, and pesticides which are not easily dissolved in water.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.

## Risk

The probability that something will cause injury, linked with the potential severity of that injury. Risk is usually indicated by how many extra cancers may appear in a group of people who are exposed to a particular substance at a given concentration, in a particular pathway, and for a specified period of time. For example, a 1%, or 1 in 100 risk indicates that for 100 people who may be exposed, 1 person may experience cancer as a result of the exposure.

## U.S. Environmental Protection Agency (EPA)

Established in 1970 to bring together parts of various government agencies involved with the control of pollution.

# Volatile organic compound (VOC)

An organic (carbon-containing) compound that evaporates (volatilizes) easily at room temperature. A significant number of the VOCs are commonly used as solvents.

## **Background and Statement of Issues**

The Washington State Department of Health (DOH) has prepared this health consultation in response to health concerns raised by businesses located adjacent to the Philip Services Corporation's (Philip Services) facility in the Georgetown area of Seattle, Washington where contaminants have reportedly been released to the atmosphere.

The Philip Services' Georgetown facility is a permitted treatment and storage facility for industrial and household hazardous wastes located at 734 South Lucile Street (Figure 1). The facility is bounded by South Lucile Street to the south; Union Pacific Railroad – ARGO Yard to the east; Stone, Drew-Ashe, and Jones to the west; and Amalgamated Sugar Company to the north. Most of the site is covered with structures or concrete pavement and lies within a mixed industrial, commercial, and residential area.

Philip Services handles a number of hazardous wastes including contaminated solid wastes, acids, bases, and liquids and sludges that contain petroleum products, solvents, metals, pesticides, polychlorinated biphenyls (PCBs), antifreeze, cyanide, and oxidizing agents. The hazardous wastes are received and shipped off-site in bulk by tanker trucks, railcar tankers, roll-off boxes and other bulk containers and in containers such as drums, bales, and pails.<sup>1</sup>

Processes permitted at this facility include fuel blending, oxidizer treatment, and waste consolidation. Waste distillation and treatment of cyanide containing waste occurred at the facility in the past but were reportedly discontinued in 1996 and 1999, respectively.<sup>1</sup>

Hazardous waste consolidation occurs in the south bay of the upper warehouse and the process containment building (Figure 2). Most of the warehouse and the north, south, and west field container storage areas are used to store covered containers of hazardous waste. Hazardous wastes are also stored in aboveground tanks at the acid/alkaline storage area, cyanide tank system area, and the dangerous waste fuel tank system.

Emission control systems have been installed in some areas of the site to reduce the concentration of chemicals discharged to the atmosphere.<sup>1</sup> These systems operate under permits issued by the Puget Sound Clean Air Agency (PSCAA).<sup>2,3,4</sup>

#### Site Visit

A DOH representative visited the Philip Services' Georgetown facility on February 1, 2001, to observe site conditions.<sup>5</sup> A Washington State Department of Ecology (Ecology) representative and representatives from Philip Services participated in the site visit.

Hazardous waste handling occurs at a number of locations at the facility including the check-in area where some of the hazardous wastes are delivered to the site; the south bay of the upper warehouse where inorganic acids and bases are consolidated; the process containment building where paints, thinners, motor oil, and other organic compounds are processed and consolidated;

and the railroad and truck loading/unloading pads. Most of the remaining area of the facility is used for temporary hazardous waste storage.

Philip Services reported during the site visit that they were in the process of moving the organic chemical waste consolidation area from the south bay of the upper warehouse to the process containment building. No organic waste consolidation was being done while this move was occurring. However, processing was scheduled to begin again the week of February 5, 2001.

Little hazardous waste handling was observed during the site visit and no odors or spills were noted. However, potential air emission sources were identified during the site visit.

#### Potential Air Emission Sources

Drums of hazardous waste that are brought to the facility are opened and tested at the check-in area to verify the contents of the drums. The check-in area contains no emission control system. During the site visit, a few drums were open for sample collection. The Philip Services' representative indicated that a maximum of four drums are opened at one time and no drum remains open for more than 15 minutes.

Contaminated solid wastes that are brought to the facility are transferred to a 100 cubic yard truck trailer that is covered with a tarp near the check-in area. The truck trailer reportedly remains at the site for approximately one to two weeks, until it is full. Contaminated solid wastes that generate odors may be stored in the truck trailer according to a Philip Services' representative. However, no emission control system is located in this area of the site.

Activated carbon treatment systems are located at the process containment building and the south bay of the upper warehouse where waste handling and consolidation activities occur. The Philip Services' representative reported that chemical vapors generated during these activities are routed through activated carbon treatment systems to remove the various contaminants before the air is discharged to the atmosphere.

Chemical vapors collected at the railroad car and truck loading/unloading areas are generally routed back to the aboveground tanks where the waste had been stored. However, vapors are reportedly released from this system when thermal venting is necessary. The vapors are routed through an activated carbon treatment system before release to the atmosphere.

The activated carbon treatment systems at the railroad and truck loading/unloading and the process containment building are monitored weekly with a photoionization detector (PID) to determine whether the activated carbon is effectively removing the contaminants from the waste stream before it is discharged to the atmosphere according to the Philip Services' representative. A PID reading of 5 parts per million (ppm) triggers replacement of the activated carbon. The rationale for using this trigger level is not clear. Based on observation of some the recorded PID readings kept by Philip Services, it appears that the systems may periodically exceed the 5 ppm trigger level before the activated carbon is replaced. Spent carbon is reportedly shipped off-site

for incineration

An activated carbon vapor treatment system is also located in the south bay of the upper warehouse. The south bay also contains an air scrubber system to enhance recovery of base and acid vapors before the air passes through an activated carbon system. The air scrubber system reportedly operates under optimal conditions when the water in the treatment system has a pH of 7. Acids or bases are added to the system to maintain optimal operating conditions. Non-neutral conditions may result in the release of acidic or basic vapors. The acid gas treatment system is monitored periodically to ensure that neutral pH levels are maintained. However, no written records were available during the site visit to determine the frequency or the results of the monitoring.

A soil vapor extraction (SVE) system is located in the east central portion of the site to cleanup soils contaminated with volatile organic compounds. A Philip Services representative indicated that the catalytic oxidation system combusts the volatile organic chemicals and a wet scrubber removes the acid gas from the air stream before it discharges to the atmosphere.

#### **Discussion**

Businesses located near Philip Services' report that hazardous waste handling practices at the facility have resulted in the release of chemicals to the atmosphere. These releases have been characterized as "odors," "vapors," "steam vapors," "gases," "fumes," "airborne discharges," "dust," and "mist." Analytical data are not available to characterize the frequency, amount, or chemical make-up of these releases. Reports indicate, however, that such releases occur on a fairly frequent basis with varying duration. 6, 7, 8

Employees at a nearby rail yard have reported releases of chemicals from the Philip Services' facility that have resulted in health effects including headache, nausea, dizziness, shortness of breath, and vomiting. Two railroad workers were reportedly taken to the hospital in July 1999 after one of the reported chemical releases occurred.<sup>4</sup>

These reports of chemical releases from the Philip Services' facility are consistent with observations made by Philip and various regulatory agencies about the operation of the facility. A representative from PSCAA inspected the facility in October 1999 and noted that the activated carbon treatment systems were being monitored when no emissions were being directed to the systems and were not being operated properly. It was also noted that the hoods, booths, and duct work that send contaminated air to the activated carbon filters did not meet standard design parameters. The PSCAA representative also observed that the catalytic oxidation unit and the wet scrubber used to treat vapors from the soil vapor gas extraction system in the eastern portion of the facility were not being monitored as required by their air permit.<sup>9</sup>

In its 1999 VOC emissions/release report, which was submitted to PSCAA in July 2000, Philip Services estimated that 3,460 pounds of volatile organic compound emissions were generated at the facility during that year. Approximately 920 of the 3,460 pounds of volatile organic

compounds were reportedly released to the atmosphere without treatment. Approximately 630 pounds of the untreated volatile organic compounds were reportedly fugitive emissions from pipes and pumps.<sup>1</sup>

Philip Services also reported in its 1999 VOC emissions/release report that approximately 50 percent of the emissions from the process containment building, where paints, solvents, and other organic chemicals are handled, were released directly to the atmosphere. The remaining 50 percent of the emissions from the process containment building were routed through an activated carbon treatment system before discharging to the atmosphere. It appears that a similar percentage of untreated emissions were being released from the south bay of the upper warehouse in 1999.<sup>1</sup>

The information provided by Philip about the process containment building and the south bay of the warehouse is consistent with observations made by the Washington State Department of Ecology, during a March 1, 2000, Resource Conservation and Recovery Act (RCRA) air quality compliance inspection. It was noted that emissions from portions of work areas where hazardous chemicals were being handled vented directly to the atmosphere rather than being routed through the treatment systems. The March 2000 inspection was a follow-up to a December 1992, Environmental Protection Agency (EPA) air emission compliance inspection.<sup>10</sup>

As noted above, emissions from the Philip Services' facility are not limited to those that discharge through the various treatment systems. Untreated emissions likely discharge to the atmosphere at the truck trailer where contaminated solid wastes are stored as well as from facility piping, pumps, and the process containment building. The work area and the type of work done in the south bay was recently modified to prevent the release of untreated discharges to the atmosphere. However, no data are available to confirm that the modifications eliminated the releases.

Periodic monitoring of the activated carbon treatment systems and measurement of pH at the air scrubber appear to be the only tools used to assess whether Philip is discharging contaminants to the atmosphere. This limited monitoring data, however, cannot be used to determine whether people in nearby businesses and residences are being exposed to harmful levels of chemicals.

### Conclusion

The Philip Services' facility poses an indeterminate health risk. No data are available to evaluate whether the air emissions discharged from the facility pose a threat to human health.

#### Recommendations

1. Emission control systems should be designed, operated, and maintained to prevent untreated

releases of chemicals to the atmosphere.

Action: Philip Services will modify or replace, operate, and maintain emission control systems at the facility to capture and treat chemical emissions prior to release to the atmosphere. Ecology will review the proposed emission control system modifications or replacements and operation and maintenance plans for the work areas and EPA will review the modifications and operation and maintenance plans for the soil vapor extraction system before the changes are implemented by Philip Services.

2. Emission control systems should be operated in compliance with existing regulations.

**Action**: Ecology and PSCAA will insure that the emission control systems are operated in compliance with a appropriate regulations.

3. Treated emissions should be sampled and analyzed periodically to ensure that nearby businesses and residences are not being exposed to harmful levels of chemicals. The samples should be analyzed for volatile organic compounds and any other potential contaminants to determine residual concentrations of contaminants being released to the atmosphere.

**Action:** Philip Services will collect and analyze air samples using an Ecology and PSCCA approved sampling and analysis plan. Ecology and DOH will evaluate the results of the sampling to determine whether surrounding businesses and residences are being exposed to harmful levels of chemicals.

4. Contaminated solid wastes brought to the Philip Services' facility that emit chemical vapors should not be stored in the tarp-covered, truck trailers.

**Action:** Philip Services will store contaminated solid wastes that emit vapors in appropriate containers to prevent chemicals from being released to the atmosphere. Ecology will inspect the facility periodically to ensure that solid wastes are being stored appropriately.

# **Preparer of Report**

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#### References

- 1. 1999 VOC Emissions/Release Report, Philip Services Corporation Georgetown Facility, 734 Lucile Street, Seattle, Washington, Philip Services Corporation, July 3, 2000.
- 2. Notice of Construction and Application for Approval, Soil Venting, Puget Sound Air Pollution Control Agency, August 4, 1993.
- 3. Notice of Construction and Application for Approval, Emission Control Equipment Installation, Puget Sound Air Pollution Control Agency, September 10, 1993.
- 4. Notice of Construction and Application for Approval, Reactive Chemical Treatment of Small Quantities, Puget Sound Air Pollution Control Agency, June 8, 1989.
- 5. Site Visit Summary, Washington State Department of Health, February 1, 2001.
- 6. Letter from Glenn Strieker, Rail Terminal Services to Ed Jones, EPA, August 26, 2000.
- 7. E-mail from Kristee Crowder (Stone, Drew, Ashe, and Jones) to Melissa McAfee, Puget Sound Clean Air Agency, August 9, 2000.
- 8. Letter from Dean DeLorey, Amalgamated Sugar Company to Galen Tritt, Washington State Department of Ecology, October 13, 1999.
- 9. Inspection Report, Philip Services Corp., Puget Sound Clean Air Agency, October 20, 1999.
- 10. Letter from Galen Tritt, Washington State Department of Ecology, to William Glasgow, Philip Services Corporation, September 7, 2000.

# Certification

This Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.
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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public healtl consultation and concurs with the findings.
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**ATSDR**